COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Southwest Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Vaughan Furniture Company
T.G. Vaughan Plant
Galax, Virginia
Permit No. SWRO10159

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Vaughan Furniture Company has applied for a Title V Operating Permit for its T.G. Vaughan Plant located on T. George Vaughan, Jr. Road in Galax, Virginia. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact: _____

Air Permit Manager:

Deputy Regional Director:

FACILITY INFORMATION

Permittee
Vaughan Furniture Company
T.G. Vaughan Plant
100 T. George Vaughan Jr. Road
P.O. Box 1489
Galax, VA 24333

Plant ID No. 51-640-00061

SOURCE DESCRIPTION

SIC Code 2511 – Wood Household Furniture, Except Upholstered.

The T.G. Vaughan plant is located in Galax, Virginia and manufactures wood furniture consisting primarily of case goods (SIC 2511).

There are two water tube boilers on site – both are 28 mmBtu/hr Erie City Iron Works water-tube boilers that are fueled with wood and/or coal. Both boilers incorporate multicyclones to control particulate emissions. Steam from the boilers is used to heat the drying ovens on the finishing line.

When the assembled wood components are received, they are transported to the finishing operations. The finishing of wood furniture is a multi-step process that involves the application of many layers of finishing materials to achieve the desired appearance. Both high volume/low pressure (HVLP) and airless spray guns are utilized to apply the finishing materials. Materials applied include fillers, edge fillers, wood preservatives, stains, toners, glazes, washcoats, and top coats such as sealers and lacquers. Finishing operations also include the drying and curing of the finish, which is accomplished with air drying (flash-off area) and heat (ovens).

After all of the finishes are applied, the furniture goes through final inspection, packing, and is stored in the warehouse prior to shipment to the customer.

The T.G. Vaughan plant is a Title V major source of VOC and total hazardous air pollutant (HAP) emissions. The source is located in an attainment area for all criteria pollutants.

COMPLIANCE STATUS

A full compliance evaluation of this facility, including a site visit, is conducted annually. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on the most recent compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Boilers
There are two water tube boilers on-site, both of which are existing units (and predate NSPS Subpart Dc). Both boilers are rated at 28 mmBtu/hr and can burn both wood and coal. Steam produced by the boilers is used to heat the drying ovens in the finishing operations. Both of the boilers utilize multicyclone collectors to control particulate emissions.

Finishing Operations
Many different finishing materials are applied to the furniture surfaces to achieve the desired appearance. These finishes are applied using a variety of methods - from spraying to hand rubbing. Fifteen (15) spray booths using both high volume/low pressure (HVLP) and airless spray guns apply the vast majority of the coating materials.

Emissions from finishing operations include particulate (PM/PM-10), VOC, and HAP's. Louvers and fabric (paper) filters are utilized in each of the spray booths to control particulate emissions from overspray. There are no control devices to reduce the emissions of VOC or volatile HAP.

EMISSIONS INVENTORY

The 2004 annual emissions are summarized in the following table:

2004 Criteria Pollutant Emissions (Plant-wide Total)	
Pollutant	Tons Emitted
PM_{10}	0.72
VOC	0.038
NO_X	2.38
SO_2	0.00025
CO	0.87
Pb	0.00073

EMISSION UNIT APPLICABLE REQUIREMENTS

Boilers
Erie City Iron Works Water Tube Wood/Coal-fired Boilers (B1 & B2)

Both of the boilers are existing units (installed prior to 1972) and have not been modified. The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

- 9 VAC 5-40, Article 8 (880-1040), Existing Stationary Sources, Emission Standards for Fuel Burning equipment
- 9 VAC 5-40-900, Standard for Particulate Matter (PM)
- 9 VAC 5-40-910, Emission Allocation

- 9 VAC 5-40-920, Collection Equipment Efficiency
- 9 VAC 5-40-930, Standard for Sulfur Dioxide
- 9 VAC 5-40-940, Standard for Visible Emissions
- 9 VAC 5-40-1010 Recordkeeping for fuel burning equipment.
- 9 VAC 5-20-160, Registration and Annual Update for Existing Sources.
- 9 VAC 5-40-50, Notification, Records and Reporting.

Limitations:

- 9 VAC 5-40-900 A.1.b, Standard for Particulate Matter (PM)
  Allowable particulate emissions rate (E) is to be calculated by the following:
  $E = 1.0906 * H^{-0.2594}$, where H = total mmBtu for installation
  $E = 1.0906 * (2 * 28)^{-0.2594}$ = 0.38 lb/mmBtu

- 9 VAC 5-40-930 A.1.b, Standard for Sulfur Dioxide
  Allowable SO_2 emissions (S) rate, expressed in lbs./hr, is to be calculated as follows:
  $S = 2.64 * K$, where K = total mmBtu capacity for installation
  $S = 2.64 * (2 * 28)$ = 147.84 lbs/hr

- 9 VAC 5-40-940, Standard for Visible Emissions
  Visible emissions from the exhausts of both boilers (B1 and B2) are limited to 20 percent opacity except during one six-minute period in which the opacity shall not exceed 60 percent, as determined by EPA Method 9 (per 9 VAC 5-40-20A.2). 9 VAC 5-40-20.A.4 stipulates that this condition applies at all times except startup, shutdown, or malfunction, however, this exclusion is not federally enforceable and is not included in the Title V permit.

Monitoring & Recordkeeping:

The monitoring and recordkeeping requirements of 9 VAC 5 Chapter 40 have been modified to meet Part 70 requirements. Compliance with the emission standards can be demonstrated by emission calculations using the following emission factors:

Regulated Pollutant	Controlled Emission Factors (lb/ton)	
	Wood Combustion	Coal Combustion
PM	4.8 lb/ton	11.88 lb/ton
PM_{10}	4.32	4.158
SO_2	0.4	38 * S%
NO_X	7.84	11
CO	13.6	5
VOC	0.278	0.05

The wood combustion emissions factors were obtained from AP-42 Tables 1.6-1, 1.6-2, and 1.6-3. The coal combustion emission factors were obtained from AP-42, Tables 1.1-3, 1.1-4, and 1.1-14.

Vaughan Furniture Company will need to maintain records of wood and coal combustion in the boilers, as well as the sulfur and ash content of the coal purchased. These records are to be available on site for inspection and shall be kept on file for the most current five-year period.

The facility is a major source subject to Title V permitting and therefore subject to 40 CFR Part

64 - Compliance Assurance Monitoring (CAM). An emission unit is subject to CAM if it meets all of the following criteria on a pollutant-by-pollutant basis:

a. Emits or has the potential to emit uncontrolled quantities of one or more regulated air pollutants at or above major source levels,

b. Is subject to one or more emissions limitations for the regulated air pollutants for which it is major before control, and

c. Uses an add-on control device to achieve compliance with the emissions limitations.

The Erie City Iron Works boilers are emissions units that meet all of the above criteria as follows:

a. Each boiler has the potential to emit uncontrolled quantities of particulate matter above major source levels.

b. Each boiler is subject to emissions limits for particulate matter of 10.64 lb/hr (0.38 lb/MMBtu) and 46.6 tons/year, based on the standard for particulate matter, 9 VAC 5-40-900 A.1.b.

c. Each boiler uses a multicyclone to comply with the limit on particulate matter.

The permittee has installed a Magnahelic gauge as a pressure drop indicator for the multicyclone on each boiler. The permittee will be required to monitor, operate, calibrate and maintain the device according to the CAM plan in the following table:

Monitoring, Frequency, Records	Performance Criteria	Indicator Range; Averaging Period
Monitor multicyclone pressure drop readings daily. Record results daily.	Observe deviation from normal pressure drop.	Pressure drop from instantaneous observation of magnehelic gauge or equivalent is no more than 10% below established normal range.
External cyclone inspections, when pressure drop is outside the indicator range. Internal cyclone and ductwork inspection as required to alleviate any flow problems.	Inspections by a qualified employee with at least one year of experience in maintenance of mechanical equipment.	As noted above.
Maintenance logs of all maintenance activities as required by manufacturer's specifications; conduct annual maintenance activity.	A qualified employee with at least one year of experience in maintenance of mechanical equipment.	Logs maintained and available for inspection on a daily basis or as requested.

The periodic monitoring also requires weekly visible emission checks. Requirements are as stated in Section III.C. of the Title V permit. Recordkeeping requirements are associated with the CAM and periodic monitoring as noted above.

MACT Requirements – Boilers B1 and B2

The Maximum Achievable Control Technology (MACT) Standard for industrial boilers, under 40 CFR 63, Subpart DDDDD (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters), and 9 VAC 5 Chapter 60, was proposed on January 13, 2003, and promulgated on September 13, 2004. The MACT standard is applicable to this facility for the existing large boilers B1 and B2 per 40 CFR 63.7475, 40 CFR 63.7485, and 40 CFR 63.7490 (d). Refer to Section IV of the Title V permit for requirements.

Testing:

Particulate stack tests are to be conducted on each boiler at least once during the five-year term of the Title V permit. A table of test methods has been included in the permit if additional testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Streamlined Requirements:

There are no streamlined requirements for the boilers.

Finishing Operations

Limitations:

The spray booths on the furniture finishing line are all existing emission units.

- 9 VAC 5-40-80 limits visible emissions to not more than 20% opacity, except for one six-minute period in any one hour of not more than 60% opacity (excluding A1 stack).
- 9 VAC 5-40-20 (Compliance) and 9 VAC 5-40-90 (Standards for Fugitive Dust/Emissions) apply.
- The National Emission Standards for Hazardous Air Pollutants (*NESHAP*) for Wood Furniture Manufacturing Operations (MACT Subpart JJ 40CFR63.800 through 40CFR63.819) apply.
- 9 VAC 5-40-260 (Standard for Particulate Matter) applies. The hourly limit on PM emissions from the spray booths is based on the rate at which the furniture passes through each booth. The hourly limit (E) is calculated according to the following equation:

  $$E = 4.10 * P^{0.67}$$

  Where: E = PM emission rate, in lbs/hr
  P = Process weight rate in tons/hr

- Particulate emissions from spray booth SB14 (exhaust ID Ref. No. A1) shall be controlled by fiberglass filters, or equivalent. The filters shall be provided with adequate access for inspection.

- The spray booth SB14 exhaust (Ref. No. A1) shall be maintained at a centerline height of

not less than fifteen (15) feet above ground level.

- The approved coatings for application in the SB14 spray booth (exhaust Ref. No. A1) shall not contain more than 7 pounds of volatile organic compounds (VOC) per gallon as applied.

- The throughput of coating solids in the spray booth (Ref.No. A1) shall not exceed 80 pounds per day.

- The throughput of coatings in the SB14 spray booth (exhaust Ref. No. A1) shall not exceed 500 gallons per year, calculated monthly as the sum of each consecutive 12-month period.

- Emissions from the operation of the SB14 spray booth (exhaust Ref. No. A1) shall not exceed the limits specified below:

Volatile Organic Compounds (VOC)	49.00 lbs/hr	1.75 tons/yr
PM-10	0.26 lbs/hr	1.10 tons/yr

- Visible emissions from the SB14 spray booth exhaust (Ref. No. A1) shall not exceed 5 percent opacity, as determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.

Monitoring & Recordkeeping:

Monthly records of coating consumption, cumulative hours of production line operation, and weight of furniture produced, will be used to demonstrate compliance with the particulate (PM) emission limits of 9 VAC 5-40-260. The hourly process weight rate will be determined from the total weight of furniture produced, divided by the hours of production line operation. Compliance with the calculated allowable hourly PM emission rate will be demonstrated by calculating the monthly particulate emissions from each booth, divided by the monthly hours of production line operation. Monthly particulate emission calculations will be based on individual coating consumption, coating solids content, particulate transfer efficiency (50%), and particulate capture efficiency of the control device (if any).

MACT Subpart JJ contains several recordkeeping requirements for demonstrating continuous compliance with the appropriate VHAP limits on the various coatings and adhesives used at the facility. These recordkeeping requirements include maintaining copies of the following:

- A certified product data sheet for each finishing material, thinner, contact adhesive, and strippable spray booth coating subject to the emission limits in Subpart JJ;
- The VHAP content, in lb VHAP/lb solids, as applied, of each finishing material and contact adhesive subject to the emission limits in Subpart JJ;
- The VOC content, in lb VOC/lb solids, as applied, of each strippable booth coating subject to the emission limits in Subpart JJ;
- The monthly calculations and/or supporting data demonstrating compliance with the appropriate VHAP limits.
- The permittee shall maintain onsite the work practice implementation plan and all records associated with fulfilling the requirements of that plan (such as training records, inspection & maintenance plan, formulation assessment plan, etc.);

- The permittee shall maintain records of the compliance certifications submitted for each semiannual period following the compliance date, and records of all other information submitted with the compliance status report and the semiannual reports.
- All required information (including all reports and notifications) must be recorded in a form suitable and readily available for expeditious inspection and review. The files must be retained for at least 5 years. At a minimum, the most recent 2 years of data is to be retained on site, while the remaining 3 years of data may be retained off site. Such files may be maintained on microfilm, on a computer, on computer floppy disks, on magnetic tape disks, or on microfiche.

Weekly opacity checks will be conducted to demonstrate compliance with the 20% opacity limit (5% opacity for exhaust stack A1).

Testing:

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Streamlined Requirements:

None.

FACILITY-WIDE REQUIREMENTS

Limitations:

Visible Emissions: (9 VAC 5-40-80 - Standard for Visible Emissions) No owner or other person shall cause or permit to be discharged into the atmosphere from any affected facility any visible emissions which exhibit greater than 20% opacity, except for one six-minute period in any hour of not more than 60% opacity. Failure to meet these requirements due to the presence of water vapor shall not be seen as a violation.

Monitoring & Recordkeeping:

9 VAC 5-40-50 and 9 VAC 5-80-110 require that records of all emissions data and operating parameters necessary to demonstrate compliance with the permit, be maintained.

Testing:

The permit does not require facility-wide source testing. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit, if necessary to determine compliance with an emission limit or standard.

Streamlined Requirements:

There are no facility-wide streamlined requirements.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110 that apply to all Federal-operating permitted sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also

requires notification of deviations from permit requirements or any excess emissions.

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §§2.1-20.01:2 and §§10.1-1185 of the *Code of Virginia,* and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of discovery of the malfunction.

U. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in sections 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation see the comments on General Condition F.

Y. Asbestos Requirements

The Virginia Department of Labor and Industry under Section 40.1-51.20 of the Code of Virginia also holds authority to enforce 40 CFR 61 Subpart M, National Emission Standards for Asbestos.

STATE-ONLY APPLICABLE REQUIREMENTS

The following Virginia Administrative Code has specific requirements only enforceable by the State and have not been included in the Federal Operating Permit:

9 VAC 5-40-340, *Standard for odor*; and,
9 VAC 5 Chapter 60, Part II, Article 4, *Emission Standards for Toxic Pollutants from Existing Sources (Rule 6-4).*

FUTURE APPLICABLE REQUIREMENTS

There are no known future applicable requirements for this facility.

INAPPLICABLE REQUIREMENTS

The provisions of 9 VAC 5-40-300 (Standard for Volatile Organic Compounds) and 9 VAC 5-40-310 (Standard for Nitrogen Oxides) are not appropriate since the T.G. Vaughan Plant is not located in the Northern Virginia Emissions Control Area. NSPS Subpart Dc does not apply to either of the boilers since they were installed prior to June of 1989. NSPS Kb applies to storage vessels of at least 75 m^3 capacity that were constructed, reconstructed, or modified after July 23, 1984 and therefore does not apply to any of the T.G. Vaughan storage tanks.

The startup, shut down, and malfunction opacity exclusion listed in 9 VAC 5-40-20 A.4 cannot be included in any Title V permit. This portion of the regulation is not part of the federally approved state implementation plan. The opacity standard applies to existing sources at all times including startup, shutdown, and malfunction. Opacity exceedances during malfunction can be affirmatively defended provided all requirements of the affirmative defense section of this permit are met. Opacity exceedances during startup and shut down will be reviewed with enforcement discretion using the requirements of 9 VAC 5-40-20 E, which state that "At all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions.

40 CFR 63, Subpart DDDD – National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products. This subpart does not apply to this facility; the kilns, woodworking, and gluing equipment have been removed.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Regulatory Citation	Pollutant Emitted (5-80-720 B.)
	Truck Refueling Activities	9 VAC 5-80-720A	
	Welding Activities	9 VAC 5-80-720A	
	Forklifts	9 VAC 5-80-720A	

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are available for public review.

PUBLIC PARTICIPATION

A public notice appeared in The Galax Gazette on July 28, 2006, announcing a 30-day public comment period for this permit. The public comment period extended through August 28, 2006. Notice was also provided to North Carolina, Tennessee, and West Virginia as affected states. No comments or hearing requests were received.